

ACCESSION NR: AT4042642

S/0000/63/000/000/0006/0008

AUTHOR: Akulinichev, I. T.; Bayevskiy, R. M.; Belay, V. Ye. Vasil'yev, P. V.; Gazenko, O. G.; Kakurin, L. I.; Kotovskaya, A. R.; Maksimov, D. G.; Mikhaylovskiy, G. P.; Yazdovskiy, V. I.

TITLE: Results of physiological investigations aboard the "Vostok-3" and "Vostok-4" spaceships

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963. Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy\* konferentsii. Moscow, 1963, 6-8

TOPIC TAGS: biomedical monitoring, electrooculogram, pneumogram/Vostok-3, Vostok-4, EEG, EKG

ABSTRACT: A number of physiological indices were monitored during the tandem spaceflights of Nikolayev and Popovich (Vostok-3 and Vostok-4). New procedures used for the first time on these flights and improvements of existing equipment yielded a great deal of physiological information. Weightless-

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ness had no noticeable effect on the functional state of the CNS in either cosmonaut, as evaluated on the basis of performance of various tasks. EEG's showed a dominance of comparatively high-amplitude rhythms with a frequency of 5 to 7 cps, similar to those observed in athletes after intense physical exertion, during the first hours of weightlessness. Later a gradual shift toward beta-rhythms with a reduced mean amplitude of EEG biopotentials occurred. Heightened emotional stress in the first hours of flight and before reentry was reflected in decreased electrical resistance of the cortex. Functional stability of the higher involuntary nervous centers is indicated by the maintenance of normal daily variation of cortical resistance--higher at night, lower during the daytime--during the rest of the flights. EOG's (electrooculograms) were used as an index of the functional state of the vestibular apparatus. Asymmetries in oculomotor reaction, which could have indicated disturbances of the vestibular centers, were not observed in either cosmonaut. Vestibular tests not supplemented by EOG's also failed to yield any evidence of vestibular disturbance. Oculomotor activity was also used as an index of general and motor activity. Variations in oculomotor activity had a phase character. At the beginning of the flight Nikolayev, and to

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a lesser degree Popovich, showed an increase of oculomotor activity up to 4 to 6 eye movements per second. Eye movements of an uncoordinated character, of both large and small amplitude, were recorded. On the 6th and 7th orbits eye movement fell off, and later EOG's show periodic increases and decreases in oculomotor activity. Toward the end of the flight a second stable increase in oculomotor activity occurred, but its level was lower than at the beginning of the flight. Cardiac activity was monitored by EKG's (using chest leads). Increased pulse rates (from 98 to 112 for Nikolayev, and from 94 to 136 for Popovich) occurred immediately before launch, with corresponding shortening of the PQ and QT intervals. EKG changes during the powered-flight phase were similar to those observed in ground experiments with centrifuging. The maximum pulse rate during the first minute of flight was 136 for Nikolayev and 132 for Popovich. Normalization of pulse rates to the rates observed 4 hr before launch took place on Nikolayev's 6th and 7th orbit and on Popovich's 3rd to 4th orbit. Normalization of pulse to initial rates took 5 to 10 min during tests. No IKG changes indicating disturbances of automatism, excitability, or conductivity were observed. In flight Popovich registered 3 separate extra

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systoles; this had also occurred during training tests. The character of daily variation of cardiac activity remained unchanged. Pneumographic data revealed no respiratory irregularities. Some increase in respiration rate was noted during the powered-flight phase; this had also been observed during centrifuge tests. No pathological change in physiological functions of either cosmonaut was observed during flight. During the powered-flight phase, functional shifts similar to those observed during centrifuge tests occurred. Definite changes in the functional state of various physiological systems took place during the first hours of orbital flight, as indicated by the inhibition of pulse-rate normalization and the character of EEG and cortical resistance changes. Changes in the character of EEG's during prolonged (3 to 4 days) weightlessness indicate shifts in the interaction of excitation-inhibition processes in the higher levels of the CNS. However, the mental activity and neuro-regulatory functions of the cosmonauts remained at a high level.

ASSOCIATION: none

*Submitted: 27 SEP 63*

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ACCESSION NR: AT4042663

S/0000/63/000/000/0101/0104

AUTHOR: Vinnikov, Ya. A.; Gazenko, O. G.; Titova, L. K.; Bronshteyn, A. A.;  
Govardovskiy, V. I.

TITLE: A structural and cytochemical investigation of the organ of gravity (utricle of the vestibular portion of the labyrinth) during rest and under the influence of accelerations

SOURCE: Konferentsiya po aviatsionnoy i kosmicheskoy meditsine, 1963.  
Aviatsionnaya i kosmicheskaya meditsina (Aviation and space medicine); materialy konferentsii. Moscow, 1963, 101-104

TOPIC TAGS: utricle, utricle function, acceleration effect, cytochemistry, substructure, pig, monkey, pigeon

ABSTRACT: Although the role of the utricle under normal conditions in maintaining muscle tone is well known, its functional mechanism in man and animals under the influence of a gravitational field is not clear. Comparative electron microscopic and cytochemical studies were conducted on the utriculi of guinea pigs, monkeys, and pigeons during relative quiescence and brief, repeated accelerations of 10 g. Shifts in the structural and cytochemical organization of ciliary cells

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and synapses of the utricle during accelerations reflected their stimulation and the transmission of impulses. Accompanying these shifts was a progression of biochemical processes beginning with protein synthesis, leading to tissue respiration and culminating in the activity of acetylcholinesterase. Results of the investigation reveal how the utricle responds to acceleration on a subcellular level and suggest what its mechanism of regulation would be under space-flight conditions. However, processes of its specific stimulation and their correspondence with receptor regions of the vestibular organ remain unclear.

ASSOCIATION: none

SUBMITTED: 27Sep63

ENCL: 00

SUB CODE: LS

NO REF SOV: 000

OTHER: 000

Card 2/2

S/216/63/000/001/002/004  
A066/A126

AUTHORS: Vasil'yev, P.V., Voskresenskiy, A.D., Gazenko, O.G.

TITLE: Experimental studies in space physiology

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya biologicheskaya, <sup>2<sup>g</sup></sup>no. 1,  
1963, 15 - 23

TEXT: The accumulation of data relating to the physiological effects of space traveling upon the human organism makes it necessary to consider the two alternatives of experimental research: 1) the study of individual functions (heart activity, respiration, etc.) under the influence of certain factors of actual space flight; 2) the study of the physiological effects of certain factors of space flight. The second alternative involves comprehensive animal experiments which, though only indicative of the relevant reactions of the human organism, make it possible to work out diagnostic criteria and training programs. The necessity of experimental research into the physiological mechanisms is illustrated by the effects of transverse acceleration. Data relative to pulmonary circulation, oxygen consumption by the cardiac muscle, oxygen tension in the

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Experimental studies in space physiology

S/216/63/000/001/002/004  
A066/A126

cerebral tissues, and the functions of the central nervous system, as well as literature data were used to set up a diagram illustrating the principal physiological effects of transverse acceleration which are as follows: 1) Changes in pulmonary ventilation and in the redistribution of blood in the lungs disturb the oxygenation of blood in the lungs; 2) redistribution of blood in the vascular system of the cerebrum, accompanied by a higher intensity of the afferent impulses, disturbs nutrition and the regulatory activity of the brain; 3) general changes of the hemodynamic conditions deteriorate the supply of O<sub>2</sub> to the heart. These pathological symptoms were observed exclusively in transverse accelerations lasting longer than 1 min. It appears possible to describe physiological changes quantitatively and to set up a model reproducing physiological changes in the human organism under various conditions of space traveling. Such a model will permit an estimate and prognosis of the astronaut's state of health. In addition, better training programs may thus be worked out, and also the action of pharmacological and other agents can be examined under conditions of space flight.

SUBMITTED: August 24, 1962

Card 2/2



VINNIKOV, Ya.A.; GAZENKO, O.G.; TITOVA, L.K.; OSIPOVA, I.V.; BRONSHTEYN, A.A.

Histochemical and ultrastructural changes in the receptor cells  
of the utricle in a changed gravitational field. Dokl. AN SSSR  
153 no.2:450-453 N '63. (MIRA 16:12)

1. Institut evolyutsionnoy fiziologii im. I.M.Sechenova AN SSSR.  
Predstavleno akademikom N.M.Sisakyanom.

X

VOLYNKIN, Yu.M.; YAZDOVSKIY, V.I., prof.; GENIN, A.M.; ~~GAZENKO,~~  
O.G.; GUROVSKIY, N.N.; YEMEL'YANOV, M.D.; MIKHAYLOVSKIY,  
G.P.; CORBOV, F.D.; SERYAPIN, A.D.; BAYEVSKIY, R.M.;  
ALTUKHOV, G.V.; KOPANEV, V.I.; KAS'YAN, I.I.; MYASNIKOV,  
V.I.; THERENT'YEV, V.G.; BRYANOV, I.I.; FEDOROV, Ye.A.;  
FOMIN, V.S.; ARUTYUNOV, G.A.; ANTIFOV, V.V.; KOTOVSKAYA,  
A.R.; KAKURIN, L.I.; TSELIKIN, Ye.Ye.; USHAKOV, A.S.;  
VOLOVICH, V.G.; SAKSONOV, P.P.; YEGOROV, A.D.; NEUMYVAKIN,  
I.P.; TALAPIN, V.F.; SISAKYAN, N.M., akademik, red.;  
KOLPAKOVA, Ye.A., red.izd-va; ASTAF'YEVA, G.A., tekhn.red.

[First group space flight; scientific results of medical  
and biological studies carried out during the group orbital  
flight of manned satellites "Vostok-3" and "Vostok-4"]  
Pervyi gruppovoi kosmicheskii polet; nauchnye rezul'taty  
mediko-biologicheskikh issledovaniy, provedennykh vo vremya  
gruppovogo orbital'nogo poleta korablei-sputnikov "Vostok-3"  
i "Vostok-4." Moskva, Izd-vo "Nauka," 1964. 153 p.  
(MIRA 17:3)

GAZENKO, O. G., SISAKYAN, N. M., and ANTIPOV, V. V. (Acad. Sci. USSR)

"Satellite Biological Experiments" (Major Results and Problems)

Report presented at the COSPAR, 5th Intl Space Science Symposium, Florence,  
Italy, 8-20 May 1964

L-63245-65 EEO-4/EEO-2/ENG(c)/ENG(j)/ENG(r)/EEC(k)-2/ENG(v)/EWT(d)/EWT(l)/FS(v)-3/  
EWA(d)/FSS-2 Pe-5/Pe-l/Pi-l/Pk-l/Pl-l/Po-l/Pq-l/Pac-l/Pae-2 TT/RD/GW/GS  
ACCESSION NR: AT5013041 UR/0000/64/002/000/0100/0105

AUTHOR: Bayevskiy, R. M. (Moscow); Voskresenskiy, A. D. (Moscow);  
Gazenko, O. G. (Moscow); Yegorov, A. D. (Moscow); Chekhonadskiy, N. A. (Moscow); Yazdovskiy, V. I. (Moscow) 21  
70  
B+

TITLE: Measuring information systems in cosmic biology *q w*

SOURCE: Vsesoyuznaya konferentsiya po avtomaticheskomu kontrolyu i metodam elektricheskikh izmereniy. 4th, Novosibirsk, 1962. Avtomaticheskij kontrol' i metody elektricheskikh izmereniy; trudy konferentsiy, t. 2: Teoriya izmeritel'nykh informatsionnykh sistem. Sistemy avtomaticheskogo kontrolya. Elektricheskiye izmereniya neelektricheskikh velichin (Automatic control and electrical measuring techniques; transactions of the conference, v. 2: Theory of information measurement systems. Automatic control systems. Electrical measurements of nonelectrical quantities). Novosibirsk, Redizdat Sib. otd. AN SSSR, 1964, 100-105

TOPIC TAGS: cosmic biology, information system

ABSTRACT: A general state-of-the-art discussion and a review based on six 1956-61 Soviet and ten 1959-62 American sources are presented. Two types -

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L 63245-65

ACCESSION NR: AT5013041

research and monitoring -- of measuring information systems have been used in cosmic biology. Block diagrams of telemetering biological data under laboratory and actual flight conditions are shown. Automatic data-processing systems are used for quick diagnosing of man's condition and situations. The effect of weightlessness on the autocorrelation function of G. S. Titov's pulse frequency is shown. Ways for using mathematical simulation of bio processes are figured out. The problems of reliability of equipment are discussed, as well as the "small telemetry" (between the astronaut and his ship-borne equipment). Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 17Nov64

ENCL: 00

SUB CODE: LS, SV

NO REF SOV: 006

OTHER: 010

Vostok 2

12

KC  
Card 2/2

L-63246-65<sup>1</sup> EEC-4/EED-2/FEO-2/ENG(c)/ENG(j)/ENG(r)/EEG(k)-2/ENG(v)/ENT(d)/ENT(l)/  
FS(v)-3/EWA(d)/EEG(c)-2/ISS-2 Ps-5/Pi-4/Pn-4/Po-4/Pp-4/Pq-4/Pae-2 TT RD/GW/CS  
ACCESSION NR: AT5013042 UR/0000/64/002/000/0106/0111

AUTHOR: Akulichev, I. T. (Moscow); Bayevskiy, R. M. (Moscow); Gazenko, O. G. (Moscow); Zazykin, K. P. (Moscow); Shadrintsev, I. S. (Moscow)

TITLE: Sensors for physiological research under space-flight conditions

SOURCE: Vsesoyuznaya konferentsiya po avtomaticheskomu kontrolyu i metodam elektricheskikh izmereniy. 4th, Novosibirsk, 1962. Avtomaticheskii kontrol' i

metody elektricheskikh izmereniy; trudy konferentsiy, t. 2: Teoriya izmeritel'nykh informatsionnykh sistem. Sistemy avtomaticheskogo kontrolya. Elektricheskiye izmereniya neelektricheskikh velichin (Automatic control and electrical measuring techniques; transactions of the conference, v. 2: Theory of information measurement systems. Automatic control systems. Electrical measurements of nonelectrical quantities). Novosibirsk, Redizdat Sib. otd. AN SSSR, 1964, 106-111

TOPIC TAGS: sensor, biosensor, biotelemetry

ABSTRACT: A general state-of-the-art discussion and a review based on four 1958-63 Soviet and eight 1952-62 American sources are presented. A block

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L 63246-65

ACCESSION NR: AT5013042

diagram of physiological measurements in space flight is explained. Methods of physiological research used in Soviet space flights (electrocardiography, arterial oscillography, pneumography, actography, etc.) are tabulated and their application to the Soviet astronauts is explained. The sensors of various physiological functions which have been used in cosmic flights are mentioned and their characteristics tabulated. Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: none

SUBMITTED: 17Nov64

ENCL: 00

SUB CODE: LS, SV

NO REF SOV: 004

OTHER: 008

MC  
Card 2/2

ACCESSION NR: AP4015104

S/0025/64/000/001/0026/0031

AUTHOR: Gazenko, O. (Doctor of biological sciences)

TITLE: Those who stay behind on Earth

SOURCE: Nauka i zhizn', no. 1, 1964, 26-31

TOPIC TAGS: aviation medicine, space medicine, Strel'tsov, Orbeli, Apollonov, Pereskokov, Rezenkov, Vladimirov, pressure chamber, heat chamber, respiration, pressure, heat, reentry

ABSTRACT: Broadly surveyed is the 50-year history of aerospace medicine from its beginnings in aviation medicine, with a recital of the contributions from groundling medical researchers which have enabled Soviet hero cosmonauts to conquer space. The science was founded by Prof. V. V. Strel'tsov who 30 years ago in Moscow headed the first aviation medicine research center. He investigated the strains on the pilot's organism arising during acrobatic maneuvering at high altitude; organized and advocated a program of pilot physical training to increase resistance to such strain. Long in advance of stratospheric airplanes and space-

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ACCESSION NR: APh015104

craft, the first and most urgent task of space medicine was anticipated and investigated, viz.: the physiology of respiration in a rarefied atmosphere and the effect of elevated intrapulmonary pressure on man. Experiments were conducted in primitive pressure chambers (A. P. Apollonov improvised his own), with aerostats (A. A. Pereskokov), aircraft flights, experimental investigations in the highest of the Caucasus mountains (Academician I. P. Rezenkov, G. Ye. Vladimirov). This research eventuated in the creation of reliable equipment and systems which would not fail in flight or in the event that the cabin became depressurized. In order to protect man from the high temperatures generated when an airplane or spacecraft passes through Earth's atmosphere, research was conducted in heat chambers and in torrid deserts with the view of devising special suits and of determining the limits of man's endurance of such conditions. A very wide variety of animals has been used in space medicine research. The first human subjects have always been the experimenters themselves.

ASSOCIATION: none

Card 2/3 2

ACCESSION NR: APL026727

S/0216/64/000/002/0280/0297

AUTHOR: Moskalenko, Yu. Ye.; Gazenko, O. G.; Shurubura, A. A.;  
Kas'yan, I. I.; Graunov, O. V.

TITLE: Dynamics of hemocirculatory parameters of the cerebrovascular system during longitudinal gravitational loads

SOURCE: AN SSSR. Izv. Seriya biologicheskaya, no. 2, 1964, 280-297

TOPIC TAGS: cerebral blood circulation, cerebrovascular hemocirculatory system, gravity acceleration, longitudinal gravitational load, blood pressure change, blood volume change, electroplethysmograph, data unit electrical system, cerebrospinal blood pressure change, central nervous system development, respiration movement, brain oxygen intensity, gravitational load sensitivity threshold, cerebrovascular mechanical regulation, cerebrovascular chemical regulation

ABSTRACT: In a series of 64 experiments changes in blood volume and pressure were studied in the cerebrovascular systems of dogs, cats, rabbits, and rats. In each of the experiments the animal was subjected to 15-20 tests on a rotating stand with longitudinal

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ACCESSION NR: AP4026727

gravitational loads up to + 1 g, and in some experiments animals were tested on a centrifuge with acceleration up to 10 g. Blood volume changes were measured by electroplethysmograph and blood pressure changes were recorded by tensoclectric manometers. Arterial pressure and respiratory movement were measured by data units, and oxygen intensity in the brain was determined by a polarographic method. Readings for all data units were registered on a K 12 21 oscillograph. Results show that the sensitivity threshold of the cerebrovascular system to longitudinal gravitational loads lies within limits of 0.2 to 0.5 g, depending on central nervous system development and the ecology of the animal. The active physiological reactions of the cerebrovascular system 5-10 sec after exposure to longitudinal gravitational loads are autoregulatory, with arterial pressure changes affecting vessel tone. With lack of oxygen and CO<sub>2</sub> accumulation in the brain 15-25 sec after exposure, compensatory reactions of a chemical regulatory nature appear. Orig. art. has: 13 figures, 3 tables.

ASSOCIATION: Institut evolyutsionnoy fiziologii im. I. M. Sechenova AN SSSR (Institute of Evolutionary Physiology AN SSSR)

Card 2/3

ACCESSION NR: APL4026727

SUBMITTED: 14Sep63

DATE ACQ: 22Apr64

ENCL: 00

SUB CODE: AM

NO REF SOV: 009

OTHER: 022

Card 3/3

GAZENKO, O.G.; CHERNIGOVSKIY, V.N.; YAZDOVSKIY, V.I.

Biological and physiological studies during flights on board of  
rockets and artificial earth satellites. Probl. kosm. biol. 3:  
23-36 '64. (MIRA 17:6)

AKULINICHEV, I.T.; ANDREYEV, L.F.; BAYEVSKIY, R.M.; BAYKOV, A.Ye.; BUYLOV, G.G.  
GAZENKO, O.G.; GRYUNTAL', R.G.; ZAZYKIN, K.P.; KLIMENTOV, Yu.F.;  
MAKSIMOV, D.G.; MERKUSHKIN, Yu.G.; MONAKHOV, A.V.; PETROV, A.P.;  
RYABCHENKOV, A.D.; SAZONOV, N.P.; UTYAMYSHEV, R.I.; FREYDEL', V.R.;  
KHIL'KEVICH, B.G.; SHADRINTSEV, I.S.; SHEVANDINA, S.B.; ESAULOV,  
N.G.; YAZDOVSKIY, V.I.

Method and means of medical and biological studies in a space  
flight. Probl. kosm. biol. 3:130-144 '64. (MIRA 17:6)

ACCESSION NR: AT4037706

S/2865/64/003/000/0366/0378

AUTHOR: Moskalenko, Yu. Ye.; Graunov, O. V.; Gzenko, O. G.; Kas'yan, I. I.

TITLE: Reactions of the vascular system in the intracranial cavity to equivalents of longitudinal g-loads

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 3, 1964, 366-378

TOPIC TAGS: acceleration, brain, circulation, cerebral circulation

ABSTRACT: Electroplethysmographic (EPG) methods have been used to study intracranial hemodynamics in response to simulated or equivalent longitudinal g-loads obtained by rotating animals (rats, rabbits, and cats) in a vertical plane. The vectorial gravitational changes so produced induced active reactions in the vascular system of the brain. These changes occur 4 to 8 sec after the body posture has been changed. Their function is to normalize the blood filling of the intracranial cavity. Special experiments have shown that these active reactions are specific for cerebral blood vessels and that their threshold of sensitivity appears when the change is equivalent to 0.3 to 0.4 g. The data obtained indicate that

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ACCESSION NR: AT4037706

when animals are subjected to simulated longitudinal g-loads (head down), the organs of the central nervous system undergo a shortage of circulation and require compensation on the part of adaptive mechanisms.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: PH, LS

NO REF SOV: 004

OTHER: 007

Card 2/2



GAZENKO, O.G.; KAS'YAN, I.I.; KOTOVSKAYA, A.R.; YUGANOV, Ye.M.; YAZDOVSKIY, V.I.

Physiological reactions of animals during their flight in the  
third, fourth and fifth spaceships. Izv. AN SSSR. Ser. biol.  
no. 4:497-511 JJ-Ag '64.

(MIRA :7:10)

ACCESSION NR: AP4034554

S/0020/64/155/005/1233/1236

AUTHOR: Gzenko, O. G.; Yegorov, B. B.; Razumeyev, A. N.;  
Chekhonadskiy, N. A.

TITLE: Changes in neuron rhythm of the reticular formation during transverse  
accelerations

SOURCE: AN SSSR. Doklady\*, v. 155, no. 5, 1964, 1233-1236

TOPIC TAGS: neuron, reticular formation, electroencephalography,  
neuron potential, physiological stress, centrifuge

ABSTRACT: The effect of overload on the higher brain centers has assumed  
importance in connection with space flights. Changes in the electroencephalo-  
gram upon accelerations may be caused by a number of factors: hypoxia, decreased  
circulation, increased influx of impulses over the efferent system, etc. Their  
influence on the reticular system, the integration center of efferent impulses,  
was studied in 7 cats, involving 100 neurons. The neuron potential was mea-

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sured with electrodes implanted in the neurons. The 3—5 g overload was created by means of a centrifuge provided with an alternating current amplifier, so that the signal reaching the centrifuge was of the order of 30 v. After termination of the experiment the brain was removed and the electrode location verified. Test conditions are described. Results showed that acceleration changed the activity of the various neurons by stages, the initial being a rhythmic repeat impulse, followed by grouped impulses and finally by complete impulse absence (quiet phase). The changes are apparently caused by the effect of the current impulses reaching the giant cell nucleus of the reticular formation over the afferent system. The influence of acceleration may be imagined as the summary result of 2 processes developing simultaneously in the neurons. The first process will lead to quantitative increase of impulses, the second to their decrease. However, development of the second process lags behind the first. At this stage hypoxia does not seem to play any role. The results are figured and formulas presented for calculating neuron activity during the various phases. Orig. art. has: 3 figures and 4 formulas.

Card 2/ 3

ACCESSION NR: AP4034554

ASSOCIATION: None

SUBMITTED: 09Sep63

ATD PRESS:

ENCL: 00

SUB CODE: LS, PH

NO REF SOV: 005

OTHER: 003

Card 3/3

VOLYNKIN, Yu.M.; ARUTYUNOV, G.A.; ANTIPOV, V.V.; ALTUKHOV, G.V.;  
BAYEVSKIY, R.M.; BELAY, V.Ye.; BUYANOV, P.V.; BRYANOV, I.I.;  
VASIL'YEV, P.V.; VOLOVICH, V.G.; GAGARIN, Yu.A.; GENIN, A.M.;  
GORBOV, F.D.; GORSHKOV, A.I.; GUROVSKIY, N.N.; YESHANOV, N.Kh.;  
YEGOROV, A.D.; KARPOV, Ye.A.; KOVALEV, V.V.; KOLOSOV, I.A.;  
KORESHKOV, A.A.; KAS'YAN, I.I.; KOTOVSKAYA, A.R.; KALIHERDIN,  
G.V.; KOPANEV, V.I.; KUZ'MINOV, A.P.; KAKURIN, L.I.; KUDROVA,  
R.V.; LEBEDEV, V.I.; LEBEDEV, A.A.; LOBZIN, P.P.; MAKSIMOV,  
D.G.; MYASNIKOV, V.I.; MALYSHKIN, Ye.G.; NEUMYVAKIN, I.P.;  
ONISHCHENKO, V.F.; POPOV, I.G.; PORUCHIKOV, Ye.P.; SIL'VESTROV,  
M.M.; SERYAPIN, A.D.; SAKSONOV, P.P.; TERENT'YEV, V.G.; USHAKOV,  
A.S.; UDALOV, Yu.F.; FOMIN, V.S.; FOMIN, A.G.; KHLEBNIKOV, G.F.;  
YUGANOV, Ye.M.; YAZDOVSKIY, V.I.; KRICHAGIN, V.I.; AKULINICHEV,  
I.T.; SAVINICH, F.K.; STUPURA, S.F.; VOSKRESENSKIY, O.G.;  
GAZENKO, O.G., ~~SISAKYAN~~, N.M., akademik, red.

[Second group space flight and some results of the Soviet  
astronauts' flights on "Vostok" ships; scientific results of  
medical and biological research conducted during the second  
group space flight] Vtoroi gruppovoi kosmicheskii polet i neko-  
torye itogi poletov sovetskikh kosmonavtov na korabliakh  
"Vostok"; nauchnye rezul'taty medikobiologicheskikh issledovaniy,  
provedennykh vo vremia vtorogo gruppovogo kosmicheskogo poleta.  
Moskva, Nauka, 1965. 277 p. (MIRA 18:6)

GAZEMER, D.D. (Moskva); CHEKHONADSKIY, N.A. (Moskva)

perception of some mechanical values peculiar to the organism of an  
animal. Avtometriia no.2:11-17 '65. (MIRA 18:9)

IN RE: JAMES EARL RAY; Defendant. Cause No. 00-00000-0000 (U.S. Dist. Ct.)

Left bundle branch and problems of infarct zone cardiology. Kardiologiya  
No. 6:13-17 1955. (MIRA 18:10)

VOSKRESENSKIY, A.D.; GAZENKO, O.G.; IZOSIMOV, G.V.; MAKSIMOV, D.G.;  
YAZDOVSKIY, V.I.; KOPANEV, V.I.

Some physiological data for the evaluation of the state and  
efficiency of astronauts in orbital flights. Probl. kosm.  
biol. 4:227-236 '65. (MIRA 18:9)



GAZENKO, O.G.; CHEKHONADSKIY, N.A.; RAZUMEYEV, A.N.; YEGOROV, B.B.

Elementary model of the vestibular apparatus. Probl. kosm. biol.  
4:543-554 '65. (MIRA 18:9)

L 1986-66 EWT(1)/FSS-2/FS(v)-3/EEC(k)-2/EWA(d) WVH/TT/RD/GW  
ACCESSION NR: AP5022131 UR/0030/65/000/008/0019/0026  
613.693

AUTHOR: Gazenko, O. G. (Doctor of biological sciences); Gyurdzhian, A. A.  
(Candidate of medical sciences)

TITLE: Medical-biological investigations aboard spacecraft of the  
"Voskhod" type

2 SOURCE: AN SSSR. Vestnik, no. 8, 1965, 19-26 34/13

TOPIC TAGS: astronautic personnel, biologic acceleration effect,  
biologic deceleration effect, biologic vibration effect, weightless-  
ness, psychologic stress, isolation test, flight disorientation,  
space radiation hazard

ABSTRACT: A preliminary analysis of medical findings for Voskhod-1  
and Voskhod-2 crew members is presented. Medical investigations  
consisted primarily of monitoring physiological indices and studying  
cosmonaut reactions and work capacity. With a doctor (B. B. Yegorov)  
aboard Voskhod-1, additional medical investigations including blood  
tests, vestibular analyzer tests, and recording of various bioelectric  
data were conducted. Conclusions on the condition of cosmonauts  
during flight are based on biotelemetric data, medical tests,

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L 1986-66

ACCESSION NR: AP5022131

analysis of two-way radio communications, television observations, and personal accounts. The danger of irradiation effects is ruled out on the basis of dosimetric and biological test data. All five cosmonauts withstood the active part of Voskhod-1 and Voskhod-2 flights very well, with physiological indices showing lesser shifts than for the Vostok series. Thus, from a medical and psychological point of view space flights with a three man crew (Voskhod-1) or two man crew (Voskhod-2) display distinct advantages over one man flights (Vostok series). Even the Voskhod preflight indices were more favorable. An analysis of work performance data for Voskhod-1 and Voskhod-2 crews shows that the work capacity of cosmonauts remains sufficiently high to carry out flight program tasks successfully. Physiological data recorded during flight and postflight physical examinations have not disclosed any basic functional disorders of the organism. However, during flight the appearance of vestibular-vegetative disturbances, fatigue, blood circulation disorders, and metabolic disorders is possible and requires the development of proper preventive and training measures. With improved methods of personnel selection and training and further development of man's capacity to adapt to new conditions using

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L 1986-66

ACCESSION NR: AP5022131

protective devices, space flights of a more complex nature and more prolonged duration are feasible. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: None.

SUBMITTED: 00

ENCL: 00

SUB CODE: PH

NR REF SOV: 000

OTHER: 000

Card 3/3 DP

GAZINKO, O.O., Senior Biologist; GURBERMAN, A.I., Senior Scientist

Radio-biological studies made on the "Vostok" type spaceships.  
Vestnik SSSR 35 no.8:19-26 1g 1966.

(MIRA 1968)

L 60066-65    ENG(j)/ENG(r)/ENG(v)/ENG(a)-2/ENG(c)/EMT(1)/FS(v)-3/FSS-2    DD  
ACCESSION NR:    AP5017648    UR/0219/65/060/007/0007/0012  
612.67-063:612.827-089    31  
B

AUTHOR:    Gazenko, O. G.; Grigor'yan, R. A.; Kitayev-Smyk, L. A.; Klochkov, A. M.

TITLE:    Increased extensor tonus during weightlessness in cats with fully or  
partially removed cerebellum    ✓

SOURCE:    Byulleten' eksperimental'noy biologii i meditsiny, v. 60, no. 7, 1965, 7-12

TOPIC TAGS:    weightlessness, biological effect, cat, cerebellum, vestibular reflex,  
extensor reflex, parabolic flight

ABSTRACT:    To elucidate the role of the cerebellum in the formation of delayed and  
motor reactions to weightlessness, experiments were conducted on 4 cats, one with  
a completely removed cerebellum, another with a partially removed cerebellum, and 2  
intact controls. Weightlessness was produced during parabolic flights in a special  
aircraft which was equipped with a test chamber and photographic equipment. Each  
animal was exposed to weightlessness 12 times. The duration of each weightless  
period was 28—30 sec, preceded and followed by 1.8—2.0 g for up to 15 sec. In some  
experiments weightlessness was created without prior accelerations, and in others  
blindfolds were used during the tests. Vestibular tests were conducted before and

Cord    1/4

L 60066-65

ACCESSION NR: AP5017648

after weightlessness in both sighted and blind condition. Lifting reflexes of the head and extremities, jump preparation reflexes, reactions to tumbling, and righting reflexes were studied. Fig. 1 of the Enclosure shows how experimental and control animals reacted to weightlessness. The experiments showed that in cats with fully or partially removed cerebellums there was extensor rigidity during weightlessness. Similar manifestations were noted in intact animals, but to a lesser degree, and they disappeared upon adaptation to weightlessness. Animals with partially removed cerebellums showed sharply increased vestibular reflexes compared to intact animals or those with fully removed cerebellums. Animals with partially removed cerebellums also showed increased aggressiveness. Orig. art. has: 3 figures. [CD]

ASSOCIATION: none

SUBMITTED: 27Feb64

ENCL: 02

SUB CODE: LS

NO REF SOV: 006

OTHER: 012

ATD PRESS: 4058

Card 2/4

L 60060-05  
ACCESSION NR: AP5017648

ENCLOSURE: 02

0

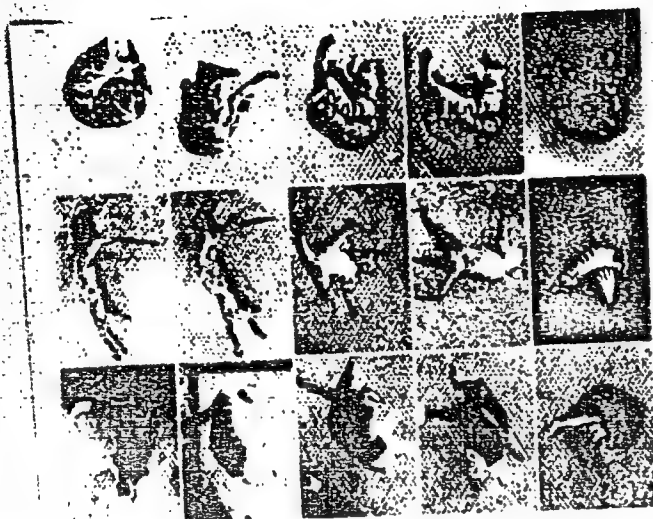


Fig. 1. Animals during weightlessness

I - Intact animal during the 10th exposure to weightlessness; II - animal lacking cerebellum during the 11th exposure to weightlessness; III - animal lacking the left hemisphere of the cerebellum during the 12th exposure to weightlessness.

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L 60065-65

ENCLOSURE: 02

ACCESSION NR: AP5017648



Fig. 2. Reaction to tumbling

I - Intact animal. a - released from hand; b - after 0.25 sec; c - after 0.5 sec (full turn); d - after 0.75 sec; e - landing;  
 II - animal lacking cerebellum;  
 III - animal lacking half the cerebellum. a - released from hand; b - after 0.125 sec; c - after 0.25 sec (full turn); d - after 0.75 sec; e - landing.

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39

L 14246-66 RD

ACC NR: AT6003857

SOURCE CODE: UR/2865/65/004/000/0227/0236

AUTHOR: Voskresenskiy, A. D.; Gazenko, O. G.; Izosimov, G. V.; Kopanev, V. I.;  
Maksimov, D. G.; Yazdovskiy, V. I.

ORG: none

TITLE: Some physiological data for evaluating the condition and work capacity of cosmonauts under conditions of orbital flight

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 227-236

TOPIC TAGS: manned spaceflight, EEG, skin, cosmonaut, space psychology, brain, biosensor, bodily fatigue, vision

ABSTRACT: This paper presents some graphic results of biomedical data from the Vostok-5 (V. F. Bykovskiy) and Vostok-6 (V. V. Tereshkova) flights. These include records of EEG's, EOG's, and skin galvanometry.

In summing up these data, the authors observed that a distinguishing feature of brain bioelectricity during the first hours and days of the flight was the increase in the index of high-frequency oscillations. No increase in the index of low-frequency oscillations was observed. Also characteristic of the initial flight period were elevated oculomotor activity and a rise in the

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L 14246-66

ACC NR: AT6003857

0

number of rapid variations in cutaneous electrical resistance per unit of time. These reactions probably reflected the emotional state associated with initial flight stages. Such factors as radio communications with ground control points and between spacecraft, the reception of commands and signals, and observation of the surface of the Earth and other heavenly bodies act as powerful stimuli eliciting a high level of psychoemotional reactions.

The process of adaptation to flight conditions was reflected in EOG and skin galvanometric indices, in that oculomotor activity and the mean number of rapid variations in the skin galvanic reaction showed significant decreases.

It is felt that the EEG, EOG, and skin galvanometric data from Vostok-5 and -6 reflected the psychoemotional adaptation of Bykovskiy and Tereshkova to prolonged spaceflight. EEG changes and a sharp decrease in oculomotor activity can act as prognostic indices of progressive fatigue. EOG data can be used to judge the effect of weightlessness on the function of the vestibular analyzer. However, it is noted that changes in all of the indices during the spaceflight did not correspond to subjective feelings of fatigue, vestibular symptoms, or a noticeable decrease in working ability. Orig. art. has:

3 figures. [ATD PRESS: 4091-F]

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 012 / OTH REF: 003

Card 2/2 FW

L 14301-66 EWT(1)/FS(v)-3 SCTB DD/RD

ACC NR: AT6003890

SOURCE CODE: UR/2865/65/004/000/0543/0,54

AUTHOR: Gazenko, O. G. (Doctor of biological sciences); Chekhonadskiy, N. A.;  
Razumeyev, A. N.; Yegorov, B. B. 62  
B+1

ORG: none

TITLE: Elementary <sup>2, 44</sup>model of the vestibular apparatus

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii,  
v. 4, 1965, 543-554

TOPIC TAGS: spacecraft capsule, human sense, audition, acceleration, central  
nervous system, neuron, space medicine equipment

ABSTRACT: The vestibular analyzer plays an important role in spatial orientation  
and can be schematically divided into two sections; receptors which perceive  
the physical factor, and the central section which coordinates receptor in-  
formation with various nervous-system formations. The purpose of this in-  
vestigation was to develop an elementary model of the vestibular apparatus  
in the interest of elucidating some functional features of this organ under con-  
ditions of a variable gravitational field.

1. Characteristics of receptors of the otolithic section of the vestibular  
apparatus

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ACC NR: AT6003890

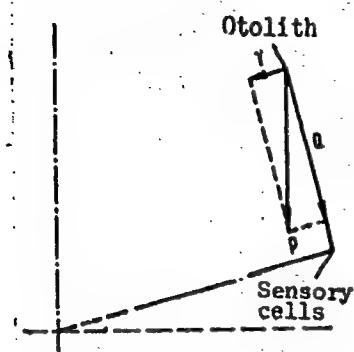


Fig. 1. Principles of a receptor

P - weight of otolith, Q - weight force directed along the afferent fiber, T - force component acting across the afferent fiber.

Figure 1 schematically represents the function of otolithic receptors.

The hypothesis is presented that the receptor reacts to the angle of head inclination relative to the vertical axis when changes in the magnitude of weight component forces of the otolith take place along or across an afferent fiber. The transformers of these changes in magnitude into impulse frequencies are sensory cells. Thus, the receptor will react both to the angle of head inclination and to acceleration forces which take place when the orga-

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L 14301-66

ACC NR: AT6003890

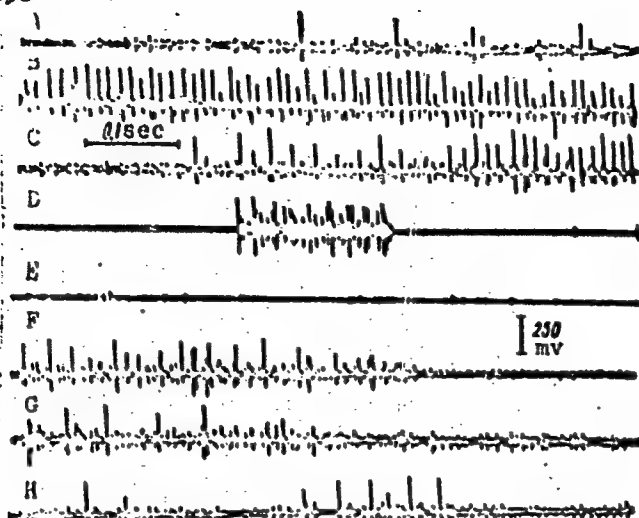


Fig. 2 Change in neuron rhythmicity in the giant cell nucleus of the reticular formation of a cat during 5-G acceleration

A - Original rhythmicity; B - activity for 35 sec of rotation (15-sec sample); C - 75 sec of rotation; D - 90 sec; E - 120-150 sec; F - termination of rotation; G - 20-50 sec later; H - 150 sec later.

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L 14301-66

ACC NR: AT6003890

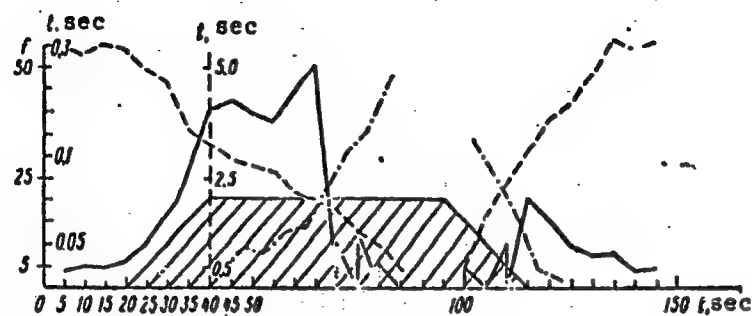


Fig. 3. Averaged results of changes in neuron rhythmicity in the giant cell nucleus of the reticular formation during 5-G acceleration

1 - Acceleration, 2 - impulse frequency, 3 - intervals between impulses, 4 - intervals between groups of impulses.

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L 14301-66

ACC NR: AT6003890

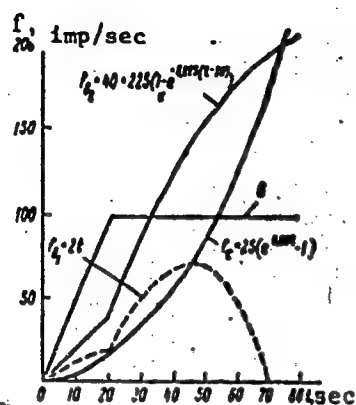


Fig. 4. Graphic representation of processes arising in a neuron during acceleration.

Card 5/12

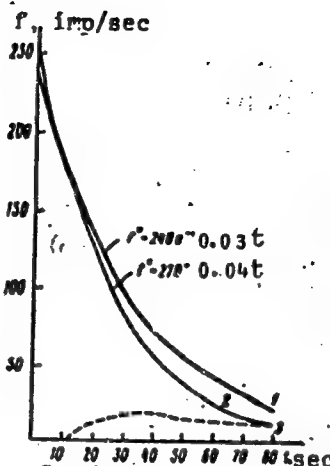


Fig. 5. Graphic representation of processes in separate neurons of the reticular formation after the termination of acceleration. 1 - Impulse frequency in the process of neuron excitation; 2 - impulse frequency in the process of neuron inhibition; 3 - aggregate curve of neuron impulse frequency.



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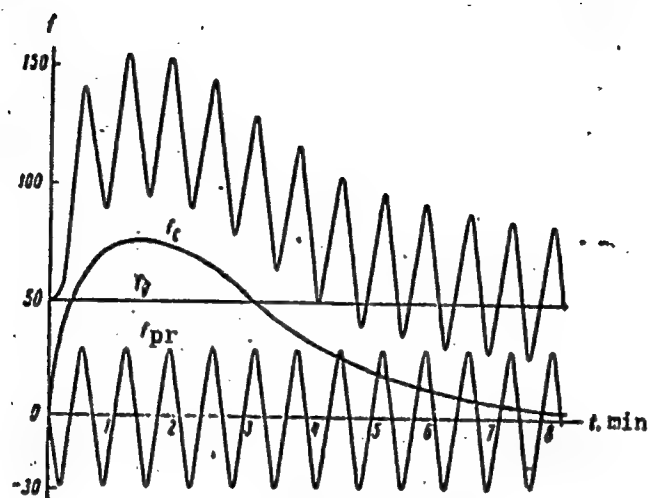


Fig. 6. Dependence of impulse frequencies in the proposed model, a rough analog to a biological system exposed to varying accelerations

$f_0$  - Stable component,  $f_{pr}$  - forced component,  $f_c$  - free component.

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L 14301-66

ACC NR: AT6003890

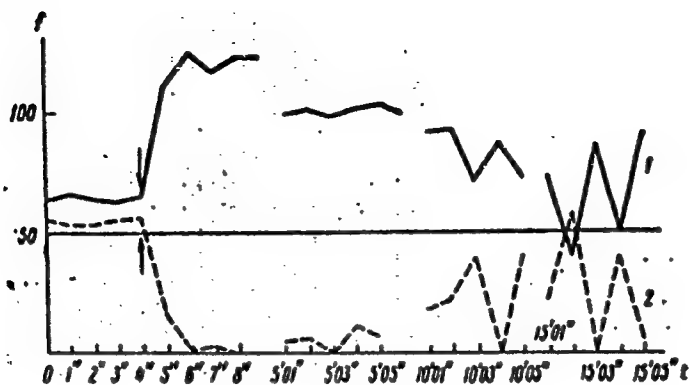


Fig. 7. Changes in the rhythmic activity of neurons during prolonged stimulation of the otolith apparatus

1 - Network no. 1; 2 - network no. 2. Vertical axis - no. of impulses/sec; horizontal axis - time of the effects of periodic force.

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L 14301-66

ACC NR: AT6003890

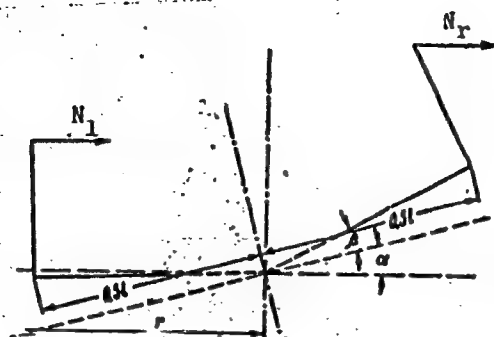


Fig. 8.  $N_L$ ,  $N_R$  - Centrifugal forces acting on the left and right otolith

$r$  - Turning radius;  $l$  - space between left and right otolith.

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L 14301-66

ACC NR: AT6003890

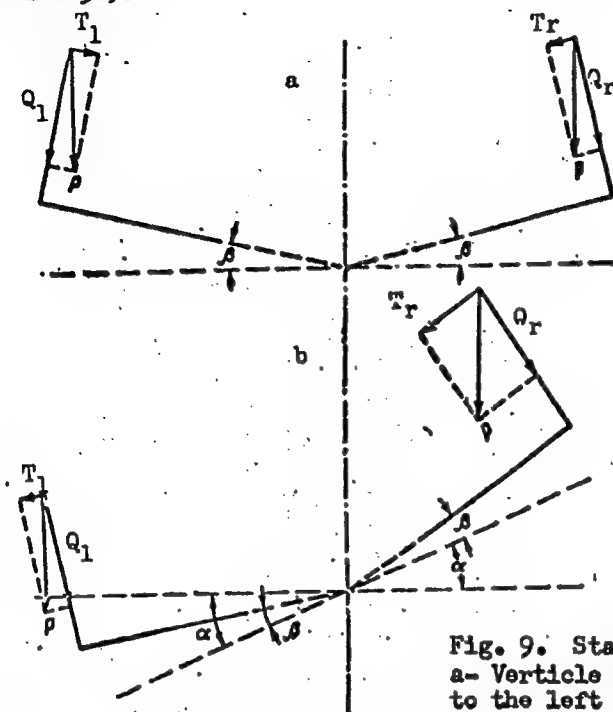


Fig. 9. Static function of the "Summator"  
a- Vertical head position; b- head inclined  
to the left (angle alpha)

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L 14301-66

ACC NR: AT6003890

ism is moving as a function of changes in otolithic weight. It has been shown that the frequency of sensory impulses increases proportionately with acceleration.

2. Reactions of receptor-neuron systems to acceleration gradually changing with time

Some results of an investigation of the rhythmic activity of 100 neurons in the giant cell nucleus of the reticular formation of a cat during 5-G acceleration are given in the following figures, along with graphic representations of neuronal processes which arise under these conditions.

Figures 4 and 5 are mathematical derivations of the experimental results. It can be seen that the aggregate curve of neuron impulse frequency is sufficiently close to the experimental curve shown in figure 3.

3. Reaction of a receptor-neuron system to acceleration periodically changing with time

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L 14301-66

ACC NR: AT6003890

The problem of the dynamic nature of "channels" of the otolithic portion of the vestibular analyzer is discussed. It is proposed that a model of a so-called receptor-neuron channel would be a circuit with constant resistance (R), inductance (L), and capacitance (C), successively switched on. The acceleration acting on the organism is likened to the circuit voltage, and the current is analogous to the electrical activity of a receptor-neuron system. Experimental data supported the feasibility of the model shown above.

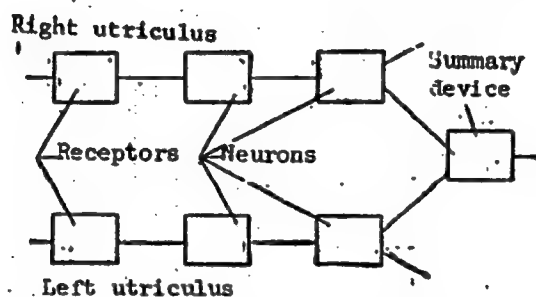


Fig. 10 Principle of the "Summator"

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L 14301-66

ACC NR: AT6003890

Figure 7 shows the modeled effects of prolonged otolithic stimulation.

4. Some principles of the so-called "summing device"

A diagrammatic representation of the so-called summing device which compares the coupled signals from the left and right utricle and the sacculus is given in Figs. 8, 9, and 10.

The author states that the summing device, working according to the proposed systems, excellently reflects the features of the movements of birds and animals with removed right and left otoliths.

It is concluded that the proposed principles of modeling the otolithic portion of the vestibular apparatus can be used to explain some general features of this important organ. It is hoped that further development in this field will lead to the creation of a much-needed electronic model for more detailed investigations of vestibular function. Orig. art. has: 10 figures and 3 formulas. [ATD PRESS: 4091-F]

SUB CODE: 06 / SUEM DATE: none / ORIG REF: 003

OC  
Card 12/12

I 21579-66 EWT(1) SCTB DD  
ACC NR: AP6009429

SOURCE CODE: UR/0020/66/166/006/1447/1450

AUTHOR: Vinnikov, Ya. A.; Gzenko, O. G.; Titova, L. K.; Bronshteyn, A. A.;  
Pevzner, R. A.; Aronova, M. Z.; Vasil'yev, P. V.

32  
B

ORG: Laboratory of Evolutionary Morphology, Institute of Evolutionary Physiology and Biochemistry im. I. M. Sechenova, Academy of Sciences SSSR (Laboratoriya evolyutsionnoy morfologii Instituta evolyutsionnoy fiziologii i biokhimii Akademii nauk SSSR)

TITLE: Electron microscopy of mitochondria in the area of utricular synapses in the inner ear of vertebrates

SOURCE: AN SSSR. Doklady, v. 166, no. 6, 1966, 1447-1450

TOPIC TAGS: inner ear, animal physiology, neurophysiology, utricle, receptor cell, synapse, centripetal acceleration, acceleration effect

ABSTRACT: Comparison of utricular receptors in resting and centrifuged animals disclosed some interesting features of the spatial relationship between the mitochondria of hair cells and their synapses. A variety of animals -- white mice, land tortoises, common frogs, pigeons, chickens, and pickerel -- were subjected to single and repeated centripetal accelerations of 10-18 G for 5-10 min. The inner ear of each animal was removed before decapitation. Electron microscopy of the utricles of experimental animals showed that the mitochondria of utricular hair cells can be in close contact with the presynaptic membrane, especially in animals subjected to

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UDC: 576.347



L 21579-66

ACC NR: AP6009429

accelerations. This grouping of the presynaptic mitochondria at the membrane was especially evident in the utricular hair cells of white mice rotated for 3 min at 18 G. Grouping of presynaptic mitochondria was also observed in efferent bud-shaped nerve endings in the utricles of frogs and tortoises centrifuged three times at 10 G. A similar phenomenon was noted in utricular cells of pickerel after 10 min of centrifugation at 10 G. It is postulated from the experimental data, including electron micrographs, that the mitochondrial apparatus of utricular receptor cells in vertebrates participates in the work of utricular synaptic structures. The authors' previous observations of the change in dehydrogenase activity of the synaptic mitochondria as a result of specific stimulation of the utricle support this conclusion. Various possible mechanisms of mitochondrial participation in the activity of synapses are presented. The results of this study are of special significance in increasing the understanding of the nature of utricular receptor excitation and the neural transmission of excitation under altered gravity conditions. An interpretation of these phenomena will be the subject of future studies. [JS]

SUB CODE: 06/ SUBM DATE: 28Jul65/ ORIG REF: 008/ OTH REF: 010/ ATD PRESS:

4219

Card 2/2

ULR

L 32698-66 EWT(1) SCTB DD

ACC NR: AP6015233

(N)

SOURCE CODE: UR/0410/65/000/002/0011/0017

AUTHORS: Gazenko, O. G. (Moscow); Chakhonadskiy, N. A. (Moscow)

ORG: none

TITLE: Perception inherent in the living organism of certain mechanical quantities

SOURCE: Avtometriya, no. 2, 1965, 11-17

TOPIC TAGS: perception, animal, acceleration, vestibular function, anatomic model, integration, differentiation, neuron, periodic pulse

ABSTRACT: The properties of an elementary model of the otolithic part of the vestibular apparatus are examined. The model (see Fig. 1) explains a number of functions of this organ and has the following properties: 1) the sense organs of the otolithic part of the vestibular apparatus are generator pickups, converting the angle of deflection of the head to electric pulses with a definite proportionality factor; 2) the sense organ reacts to inclination of the head; 3) the otolithic apparatus consists of a large number of sense organ-neuron networks; and 4) the vestibular apparatus contains an "adding device" which compares the frequencies of pulses from the left and right utriculi and also from the sacculus. Relations are given for measuring the magnitude and direction of the following values: deflection of the head from the vertical; linear accelerations caused by motion of the animal; centrifugal forces; and acceleration in the presence of periodic mechanical

Card 1/3

UDC: 57+61:62.506.2

L 32698-66

ACC NR: AP6015233

6

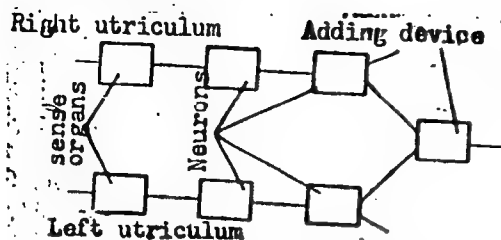


Fig. 1. Block diagram of elementary model of otolithic part of vestibular apparatus.

oscillations (see Fig. 2). On the basis of experimental data and the properties of

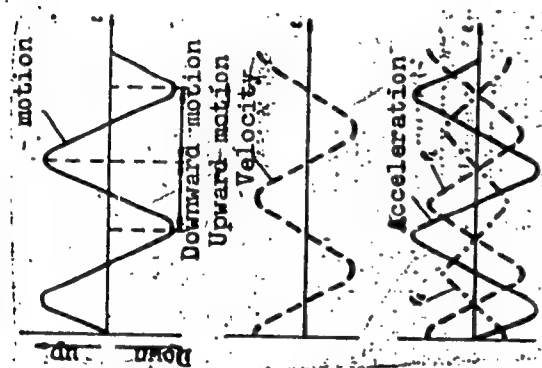


Fig. 2. Graphs of motion, velocity, and acceleration acting on organism and pulse repetition rate at output of two sense organ-neuron networks.

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L 32698-66

ACC NR: AP6015233

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the model, it is assumed that the sense organs of the otolithic part of the vestibular apparatus perceive accelerations acting on the organism, the sense organ-neuron networks differentiate and integrate the acceleration values, and the otolithic part "measures" the velocity, acceleration, and first derivative of the acceleration. Orig. art. has: 14 formulas, 4 diagrams, and 1 graph.

SUB CODE: 06/

SUBM DATE: 11Sep64/

ORIG REF: 003

Cord 3/3

BLG

ACC NR: AT7011639

SOURCE CODE: UR/0000/66/000/000/0000/0000

AUTHOR: Gazenko, O. G.

ORG: none

TITLE: Review of space physiology problems.

SOURCE: International Astronautical Congress. 17th, Madrid, 1966.  
Doklady. no. 1. 1966, [pages unknown]

TOPIC TAGS: weightlessness, physiologic effect, radiation belt, radiobiologic effect, antiradiation drug, EVA, life support system, biotelemetry, manned space flight

ABSTRACT:

Before mankind can hope to reach the Moon and the Planets, biomedical specialists will have to solve a number of major problems. Perhaps the most immediate problem to be solved is the study of the effect of prolonged weightlessness on various physiological systems of the organism. Studies should involve animal and human in-flight experiments and should include system-

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ACC NR: AT7011639

by-system studies of adjustment to weightlessness and readjustment to terrestrial gravity. These specific studies, in addition to studies of the effects of weightlessness on the cardiovascular system and the vestibular apparatus, should include studies on motor coordination, temperature regulation, metabolism, energy expenditures, digestion, and sensory physiology.

Of equal importance are studies of the effects of space radiation on living organisms. The importance of radiation studies has risen sharply because in order to get to the moon the radiation belts will have to be traversed. Soviet physiologists feel that they have insufficient data on the effects of the radiation belts and of solar flares on bio-objects. Related to the first two problems is the problem of space pharmacology: that is, the development and testing of anti-radiation, anti-acceleration and other drugs.

A fourth problem is related to EVA, the problem of development of biomechanics both with and without propulsion systems. This must be solved before the tasks of assembly in space can be undertaken. The author felt that the question of psychological stress during EVA also deserves study.

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ACC NR: AT7011639

The last two problems are related to hardware development: life-support systems and biotelemetry. The author warned that the development of life support systems is not only an engineering problem, that not all types of regenerative systems can be used for prolonged periods of time, and that much research should be devoted to the study of the physiological effects of various types of regenerative systems. The tasks of physiologists in respect to biotelemetry require selection of key physiological parameters to be monitored and development of biomedical algorithms for use in onboard and ground-based computers. [ATD PRESS: 5098-1]

SUB CODE: 06, 09 / SUBM DATE: none

Card 3/3

ACC NR: AT7004920

SOURCE CODE: UR/0000/66/000/000/0003/0007

AUTHOR: Gazenko, O. G. (Moscow); Chekhonadskiy, N. A. (Moscow);  
Razumeyev, A. N. (Moscow); Yegorov, B. B. (Moscow)

ORG: none

TITLE: Some principles of information coding inherent to biological systems

SOURCE: Vses. konf. po avtomatich. kontrol i metodam elektrich. izmereniy, 6th, 1964. Avtomatich. kontrol' i metody elektrich. izmereniy; tr. konf., t. I: Teoriya izmerit. info. sistem (Automatic control and electrical measuring techniques; transactions of the conference, v. 1: Theory of measuring information systems). Novosibirsk, Izd-vo Nauka, 1966, 3-7

TOPIC TAGS: neuron, vestibular function, electromagnetic biologic effect,  
information coding *evaluation*

ABSTRACT: The results are reported of an experimental study of information coding in some regions of the central nervous system of animals whose organism was subjected to overloads. Activity of the neurons of a giant-cell nucleus of reticular formation was studied; in practice, the activity of a chain comprising a receptor and a few series-connected neurons was observed. A cat was rotated in a centrifuge

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ACC NR: AT7004920

which created a 5-times-normal load in his organism. Pulses of 100 neurons were measured before, during, and after the overload. An inference can be drawn that the receptors of the otolith part of the vestibular apparatus generate electrical pulses of 1-2 msec duration, 1-5 mv height, at a frequency from a fraction of cps to 30 cps. With application of an overload, the frequency increases to 120-130 cps, pulse height remaining constant. It is found that: (1) The output of the receptor-neurons chain is a function of two parameters: degree of overload and time; (2) With gravity variation of 1:4000, the output-frequency limit is 150 cps. Orig. art. has: 5 figures and 7 formulas.

SUB CODE: 06 / SUBM DATE: none / ORIG REF: 004

Card 2/2

GAZENOV, St.

Some unsolved problems in the intra-plant cost accounting in chemical enterprises. Khim i industriia 35 no.6:223-228 '63.

DIMITROV, M.; GUROV, R.; GAZENOV, St.

Economic expedience of organizing the production of Bulgarian-made catalysts for the manufacture of synthetic ammonia. Khim i industriia 36 no.10:385-388 '64.

GAZER, S.L.

GRUBINSKIY, Sergey Orestovich; LAZARENKO, A.S., professor, nauchnyy redakter;  
GAZER, S.L., redakter izdatel'stva; PETROVA, T.N., tekhnicheskiy  
redakter.

[Origin of life] Preizhishdenie zhizni. [L'viv] Izd-vo L'vivskogo  
univ., 1955. 26 p.

1. Chlen-korrespondent AN USSR (for Lazarenko)  
(LIFE--ORIGIN)

MATKOVSKIY, O.I.; BOBROVNIK, D.P., professor, otvetstvennyy redaktor;  
GAZER, S.L., redaktor; SARANYUK, T.V., tekhnicheskii redaktor

[Accessory minerals of granitoids of the Osnitskiy complex in  
Volhynia] Aktsessornye mineraly granitoidov osnitskogo kompleksa  
Volyni. [L'vov] Izd-vo L'vovskogo gosuniv., 1956. 49 p.

(MIRA 10:2)

(Volyn Province--Rocks, Igneous)

VEDENEYEVA, N.Ye. [deceased]; VIKULOVA, M.F.; LAZARENKO, Ye.K., prof.,  
otv.red.; GAZER, S.L., red.; SARANYUK, T.V., tekhred.

[Using the method of staining in investigating clay minerals;  
spectrophotometric analysis] Metod issledovaniia gliniastykh  
mineralov s pomoshch'iu krasitelei; spektrofotometricheskii  
analiz. L'vov, Izd-vo L'vovskogo gos.univ., 1956. 91 p.  
(MIRA 13:3)

1. Chlen-korrespondent AN USSR (for Lazarenko).  
(Spectrophotometry) (Clay--Analysis)

GAZER, S.L.

PEKUN, Yuriy Filippovich; GAZER, S.L., redaktor; SARANYUK, T.V., tekhnicheskii redaktor

[Mineralogy of bentonite clays of the western Ukrainian provinces]  
Mineralogiia bentonitovykh glin zapadnykh oblastei USSR. [L'vov]  
Izd-vo L'vovskogo univ., 1956. 114 p. (MLA 9:10)  
(Ukraine--Bentonite)

GAZER, S.L.  
LAZ'KO, Ye.M.; DZEVANOVSKIY, Yu.K., professor, nauchnyy redaktor; GAZER,  
S.L., redaktor; SARANYUK, T.V., tekhnicheskii redaktor

[Geological structure of the western part of the Aldan crystal  
massif] Geologicheskoe stroenie zapadnoi chasti Aldanskogo  
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195 p. (MLRA 10:3)

(Aldan Plateau--Geology, Structural)



GAZER, S.L.

KOZARENKO, V.N.; LUCHITSKIY, I.V., dotsent, nauchnyy redaktor; GAZER, S.L.,  
redaktor izdatel'stva; SARANYUK, T.V., tekhnicheskii redaktor

[Geological structure of the southeastern part of eastern Trans-  
baikalia] Geologicheskoe stroenie iugo-vostochnoi chasti Vostochnogo  
Zabaikal'ia. [L'vov] Izd-vo L'vovskogo univ., 1956. 308 p. (MIRA 10:3)  
(Transbaikalia--Geology, Structural)

LAZARENKO, Ye.K., otv.red.; BOBROVNIK, D.P., prof., doktor geologo-mineral.nauk, zamestitel' otv.red.; VARTANOVA, N.S., kand. geologo-mineral.nauk, red.; YASINSKAYA, A.A., dotsent, kand. geologo-mineral.nauk, red.; QAZER, S.L., red.; SARANYUK, T.V., tekhred.

[Mineralogy of sedimentary formations] Voprosy mineralologii osadochnykh obrazovani. Otvet.red.E.K.Lazarenko. L'vov. Books 3 and 4. 1956. 673 p. (MIRA 13:7)

1.L'vov. Universitet. 2. Chlen-korrespondent AN USSR (for Lazarenko). (Mineralogy, Determinative) (Rocks, Sedimentary)

GAZER, S. L.

LAZ'KO, Yevgeniy Mikhaylovich; YERMAKOV, N.P., prof., otvetstvennyy red.;  
GAZER, S.L., red.; SARANYUK, T.V., tekhn.red.

[Crystalline quartz veins and their genesis, based on a study of the  
Aldan rock crystal deposits] Khrustalenoosnyye kvartsevye shily i ikh  
genesis na primere izucheniia Aldanskikh mestorozhdenii gornogo  
khrustalia. [L'vov] Izd-vo L'vovskogo univ., 1957. 202 p. (MIRA 11:4)  
(Rocks, Crystalline and metamorphic)

GAZER, S. L.

Call Nr QB531. E35

AUTHOR: Eygenson, Moris Semenovich

TITLE: Outline of the Physical-Geographic Manifestations of Solar Activity (Ocherki fiziko-geograficheskikh proyavleniy solnechnoy aktivnosti)

PUB. DATA: Izdatel'stvo L'vovskogo Universiteta, L'vov, 1957, 228 pp., 1,000 copies

ORIG. AGENCY: L'vovskiy gosudarstvennyy universitet imeni Iv. Franko

EDITOR: Gazer, S. L.; Scientific Ed., Shnitnikov, A. V., Doctor of Geogr. Sciences; Tech. Ed., Petrova, T. N.; Reviser, Fuks, R. Z.

PURPOSE: This book is meant chiefly for readers who are not able to avail themselves of the current periodical literature on heliogeophysics. It is also intended to serve specialists conducting research in related fields. It is regarded as useful to Soviet geophysicists, physical geographers, climatologists, hydrologists, oceanographers, meteorologists, actinographers, glaciologists, geologists, botanists, dendrologists, agrobiologists, zoologists, and others.

Card 1/5

Call Nr QB531 E35

Outline of the Physical-Geographic Manifestations of Solar Activity  
(Cont.)

**COVERAGE:** This book is devoted to certain questions of the new scientific discipline of heliogeophysics, being primarily a presentation of recent research completed by the author. It also gives an outline of the main theoretical and practical problems of heliogeophysics. The central idea of the book consists in the great effect of solar activity upon the general flow of the macrosynoptic process, and consequently, upon a multitude of particular hydrometeorological phenomena. This book deals with contributions of the author and of the following Soviet heliogeophysicists: Astanovich, I.S.; Berg, L. S.; Bezrukova, A. Ya. Belinskiy, N. A.; Vize, V. Yu.; Vitel's, L. A.; Vsekhsvyatskiy, S. K.; Gurevich, B. S.; Dobrovol'skiy, O. V.; Dmitriyev, A. A.; Ioff, I. G.; Kozik, S. M.; Maksimov, I. V.; Mandrykina, T. L.; Ol', A. I.; Predtechenskiy, P. P.; Pokrovskaya, T. V.; Prokof'yeva, I. A.; Rakipova, L. R.; Rubashev, B. M.; Skryabin, M. P.; Shnitnikov, A. V.; Shcherbinovskiy, N. S.; and others. There are 330 references, of which 179 are USSR.

Card 2/5

Call Nr QB531 E35

Outline of the Physical-Geographic Manifestations of Solar Activity  
(Cont.)

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Card 3/5

Call Nr QB531 E35

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Outline of the Physical-Geographic Manifestations of Solar Activity  
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T.V., tekhred.

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vye intoksikatsii. L'vov, Izd-vo L'vovskogo gos.univ., 1959.  
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(FOOD POISONING) (STAPHYLOCOCCAL DISEASE)

REZVOY, Dmitriy Petrovich; LAZ'KO, Ye.M., prof., nauchnyy red.; GAZEN,  
S.L., red.; SARANYUK, T.V., tekhnred.

[Tectonic structure of the eastern part of the Turkestan-Alay  
mountain system] Tektonika vostochnoi chasti Turkestano-  
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tekhnred.

[Plant growth] Rost rastenii. Otvetstvennyi red. S.O.Grebinskii.  
L'vov, Izd-vo L'vovskogo univ., 1959. 495 p. (MIRA 12:10)

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(for Grebinskiy).

(Growth (Plants))

GAZETOV, B.M.

Papillary cancer of the thyroid gland. Vent. khir. 93 no.12:97-98  
(MIRA 18:5)  
D '64.

1. Iz khirurgicheskogo otdeleniya (nauchnyy rukovoditel' - prof.  
T.P.Makarenko) Tsentral'noy klinicheskoy bol'nitsy imeni N.A.  
Semashko (nachal'nik - A.A.Potsuhsyenko) Ministerstva zutey  
zobshcheniya.

KHICHYANOV, Y.M.; GLADYSHEV, P.I.; TSYBULINA, Y.V.; FATULA, M.I.; RYVILIN, Sh.M.; FEL'DMAN, Kh.I.; FANIN, G.A.; KAGANER, A.I.; GAZETOV, B.M.; GORCHAKOV, I.

Brief information. Sov.med. 28 no.4:145-147 Ap '65.

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1. Fakul'tetskaya khirurgicheskaya klinika Chelyabinskogo meditsinskogo instituta (for Khichyanov, Gladyshev).
2. Kafedra hospital'noy terapii Volgogradskogo meditsinskogo instituta (for Tsybulina).
3. Khustskaya rayonnaya bol'nitsa Sakharovskoy oblasti (for Fatula).
4. Duvaya bol'nitsa Zhukovskogo (for Ryvlin).
5. Klinika khirurgii detskogo vozrasta Kiyevskogo meditsinskogo instituta (for Fel'dman).
6. Gospital'naya terapevticheskaya klinika i klinika otorinolaringologicheskikh bolezney Grentsburgskogo meditsinskogo instituta (for Fanin).
7. Leningradskaya obshchaya klinicheskaya bol'nitsa (for Kaganer).
8. Khirurgicheskoye otdeleniye Tsentral'noy klinicheskoy bol'nitsy imeni Somashko Ministerstva putey soobshcheniya (for Gazetov).
9. Kafedra organizatsii zdravookhraneniya i istorii meditsiny Saratovskogo meditsinskogo instituta (for Gorchakov).

GAZETOV, V.

In district centers of Perm Province. Posh.delo 4 no.11:16  
N '58. (MIRA 11:12)

1. Nachal'nik Upravleniya posharnoy okhrany Permskogo oblispolkoma.  
(Perm Province--Fire prevention)

GAZETOV, V.; SAFONOV, M.

Pumps mountable under fire-engine wheels are manufactured in Perm'. Posh.delo 6 no.6:22-23 Je '60. (MIRA 13:7)

1. Nachal'nik Upravleniya pozharnoy okhrany Permskogo oblispolkoma (for Gazetov).
  2. Nachal'nik otдела Upravleniya pozharnoy okhrany Permskogo oblispolkoma (for Safonov).
- (Perm'--Pumping machinery) (Fire engines)

KONOSHENKO, A., GAZETOV, V.

Importance of the delivery rate of water at the start of a fire.  
Pozh.delo 6 no.9:22 S '60. (MIRA 13:9)

1. Nachal'nik otдела Upravleniya pozharney okhrany Arkhangel'skogo oblispolkoma (for Konshenko). 2. Nachal'nik Upravleniya pozhar-  
noy okhrany Permskogo oblispolkoma (for Gazetov).  
(Fire extinction--Water supply)



GAZETOV, V.

Fire guard and inspection service in the city. Pozh.delo 7  
no.3:12 Mr '61. (MIRA 14:5)

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(Perm Province--Fire prevention)

DEMIDOV, A., polkovnik; GAZETOV, V., podpolkovnik

Engineer arrangements on the march of a tank battalion. Voen.  
vest. 41 no.3:31-33 Mr '62. (MIRA 15:4)  
(Military field engineering) (Tanks (Military science))

GAZEYEV, Ye. Z.

"Michurin Varieties of Fruit in Kirghizistan," Kirgiz fil., AN USSR, 1951

GAZEYEVA, G.M.

Treatment of premature pregnancy with A.V.Vishnevskii's lumbar block. Kaz.med.zhur. 40 no.1:58-59 Ja-F '59. (MIRA 12:10)

1. Iz kafedry akusherstva i ginekologii No.1 (zav. - prof.N.Ye. Sidorov) Kazanskogo gosudarstvennogo instituta dlya usovershenstvovaniya vrachey.

(PREGNANCY, COMPLICATIONS OF) (LOCAL ANESTHESIA)

1ST AND 2ND ORDERS		100 AND 2TH ORDERS	
BC 112 E 2488, L.H.		B-I-4	
PROCEDURES AND PROPERTIES INDEX			
<p>Micro-etching of bearing alloys with a tin              bath. L. H. Gagnier (Revent. Lab., 1964, 5, 686). —              Polymetallography. (1964, 1965, 4, 1966).              R. T.</p>			
METALLURGICAL LITERATURE CLASSIFICATION			
FROM SYNDICATE		COLLECTION	
100000 74		100000 74	

7

*Garz'yan LA*

PHOTOMICROGRAPHS AND POLYMERIZED FILMS

Macroetching of Babbitt metals. L. N. Garz'yan.  
Zaretskaya Lab. 5, 1342-01 (1935).—Excellent results  
were obtained in etching Babbitt metals contg. Sn with NH<sub>4</sub>  
polysulfide by the Drake method (C. A. 25, 1477).  
Photomicrographs are reproduced. Chas. Blane

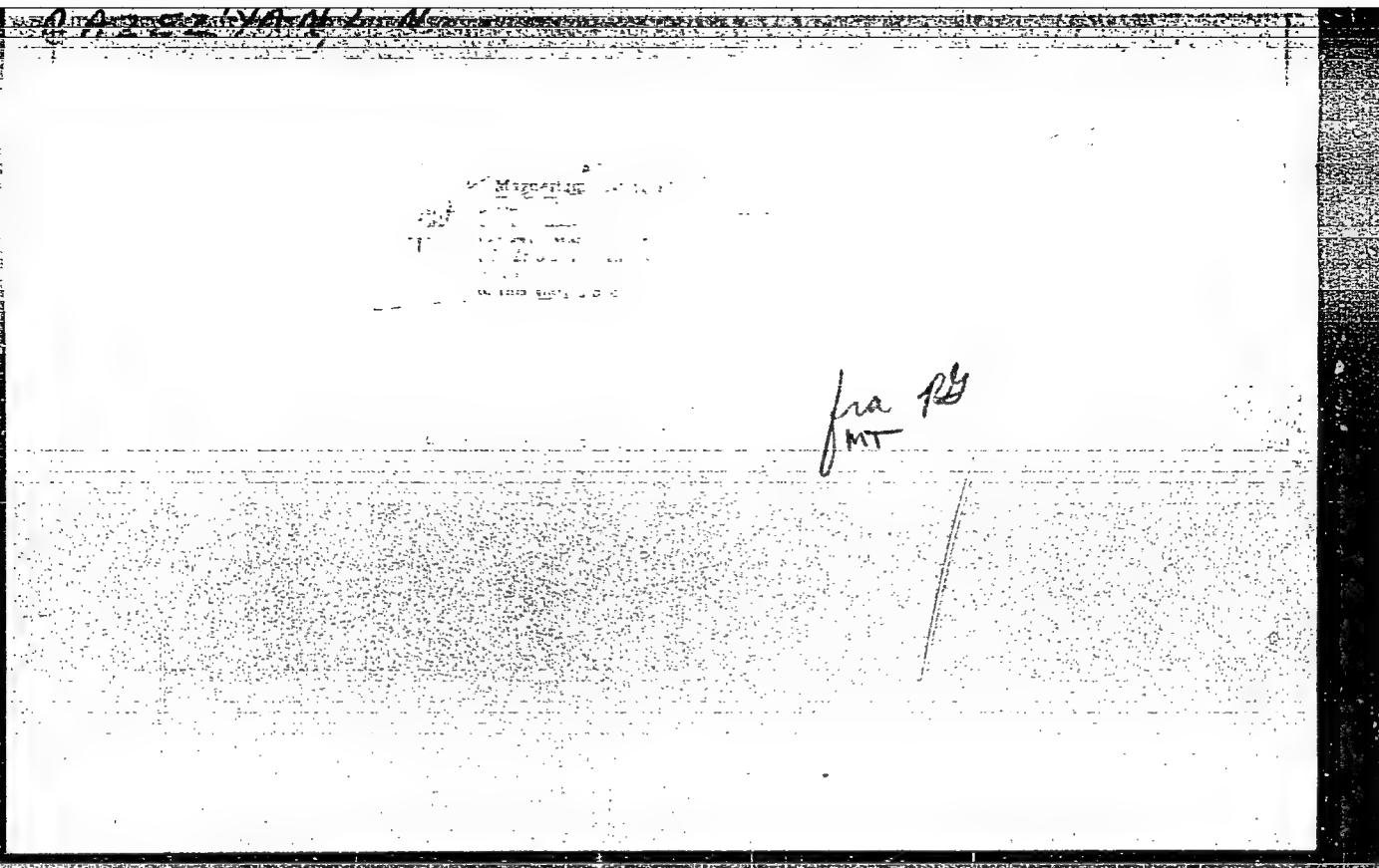
ASO-51A METALLURGICAL LITERATURE CLASSIFICATION

Met Obs.

V. S. Ginzburg, L. G.

## 21 Industrial Uses and Applications

**New Aluminum-Base Anti-Friction Alloys.** L. Gagne and T. M. Melloy (New Britain, Melloy), 1939, (U), 103-110. (In Russian.) A survey of published literature with an aluminum-base bearing alloys. Mention is made of good results obtained with the aluminum-iron type of bearing alloy developed by Junkern, -A. H.





GAZEZ'YAN, L. N.

27 27 9 4E2C  
✓ Magnesium casting alloy with a magnesium-neodymium  
base N. M. Tikhonov, V. A. Belykh, L. N. Gazez'yan, I. M. Sinyavskaya, P. S. I. I. I.  
USSR Pat. No. 1,000,000  
alloy contains Nd 3-4 wt. %, Zr 0.1-1.0 wt. %, Mn 0.1-0.2 wt. %, and  
the rest is Mg. This alloy is resistant up to 200°C.

S/137/61/000/010/035/056  
A006/A101

AUTHORS: Astrov, Ye.I., Gazez'yan, L.N., Ayzikovich, Ya.Z.

TITLE: Multilayer combinations of heat-resistant steels and alloys

PERIODICAL: Referativnyy zhurnal. Metallurgiya, no. 10, 1961, 15, abstract  
101113 (V sb. "Metallovedeniye i term. obrabotka", Gor'kiy, 1959,  
47 - 58)

TEXT: The authors studied the properties of strip and sheet multilayer steels, produced from 3 or 7 layers of stainless and heat-resistant steels of the following grades: X17H2 (Kh17N2), 1X18H9T (1Kh18N9T), X23H18 (Kh23N18), 3H437B (EI437B) and Cr.10 (St.10) steel in various combinations. The sheets of multilayer steels were 1.0 - 1.5 mm thick. It was established that  $\sigma_w$  of multilayer steels was much higher than  $\sigma_w$  of homogeneous metals. Grade TM3 -300 (UMZ-300) multilayer steel consisting of 2 layers of Kh23N18 steel with an intermediate EI437B steel layer shows high mechanical properties during brief and long lasting tests at 20, 800 and 900°C. After quenching from 1,200°C

Card 1/2

Multilayer combinations ...

S/137/61/000/010/035/056  
A006/A101

in air (without aging) multilayer GMZ-300 steel has  $\sigma_{100}^{800}$  8 kg/mm<sup>2</sup>,  $\sigma_{100}^{900}$  2.6 kg/mm<sup>2</sup> at 9 and 19% respectively. Multilayer steels shows also increased heat resistance. There are 16 references. ✓

T. Fedorova

[Abstracter's note: Complete translation]

Card 2/2

MARCHEVSKIY, V.P.; SOBOLEVSKIY, G.D.; Prinimali uchastiye: BAKUN, T.S.,  
inzh.; GAZHA, V.N., inzh.; KHRIPUNOV, L.F., inzh.; PRINIMAK, A.M.,  
starshiy tekhnik

A high-speed temperature-limiting controller for gas turbine  
systems. Energ.i elektrotekh.prom. no.4:13-18 Q-D '62.  
(MIRA 16:2)

1. Institut avtomatiki Gasplana UkrSSR.  
(Gas turbines) (Temperature regulators)